cavities were kept clean by a mild antiseptic solution, the frequency of diphtheritic inflammation would be decidedly reduced.

In the discussion which followed, Dr. A. Jacobi, president of the academy, said that he believed it to be true that the diphtheritic poison could remain in the mucous membrane, and particularly in the neighboring lymphatic glands. Persons with a healthy mouth and pharynx were less easily infected than those who had catarrh of any form. The slightest scratch might give rise to erysipelas, and the same was true of diphtheria. One point in the prevention of diphtheria was of great importance: everybody had seen cases in which the patient was apparently about getting well, but suddenly had a new attack; and the attacks might thus be renewed four or five times. This was due to infection from the curtains or other things in the room occupied by the sick. In these cases prevention of renewed attacks was possible. If there were only two rooms, the child should be transferred from the one to the other at intervals of a few days, and the vacant room cleansed and thoroughly ventilated, and, if possible, disinfected. Dr. Holt believed that enlarged tonsils favored the development, and made the attack more severe.

DIPHTHERIA CARRIED BY TURKEYS. — Dr. Paulinis, in the *Bulletin Médical*, reports a most interesting epidemic of diphtheria which occurred in Skiatos, one of the Grecian isles, in the year 1884. The population of this island at the time was about four thousand. Dr. Bild, an old practitioner, is the authority for the statement that for thirty years no case of diphtheria had been known on the island. In June a child aged twelve years was attacked with diphtheria, and died. Seven other cases occurred in the immediate neighborhood: five of these died. The disease extended, until, within a period of five months, one hundred persons were attacked, of which number thirty-six died. Three weeks before the sickness of the first child, a flock of turkeys arrived from Salonica. Two of these were sick on arrival, and each of the others was subsequently attacked. Dr. Paulinis found in the throats of the sick ones patches of false membrane. The glands of the neck were swollen, and in one bird the disease had extended to the larynx, making it hoarse. One of the turkeys, after recovery, had paralysis of the legs, and was unable to walk. Although there had been no immediate contact between the sick birds and the first child attacked, still the distance between them was slight, and a wind had been for some time blowing in a direction favorable to the transportation of the disease. Dr. Paulinis believed that the disease was contracted from the turkeys, its germs being carried by the currents of air.

LEAD IN WATER. — From a report on the recent progress in public hygiene by Dr. Samuel W. Abbott to the *Boston Medical and Surgical Journal*, we abstract the following: In Sheffield, England, cases of lead-poisoning have been very frequent; during the past winter there has been an alarming increase, the number amounting to several hundred. On inquiry, it was found that these were quite exclusively among the population supplied from the high-service reservoir, in the water of which lead was found in quantity varying from half a grain to one and a quarter grains per gallon. This water was found to be distinctly acid, claimed to be of vegetable origin, arising from the peat upon the moors. To neutralize this acid, and thus prevent its dissolving the lead in the pipes, blocks of limestone have been placed in the conduit by the water company. The public analyst does not approve of this, saying that too much limestone will injure the water, and render it as liable to act on lead as if it had not been thus treated. He advises that the lime be introduced regularly and constantly in powder, or as milk of lime. Charcoal filters have been efficacious in removing the lead, in consequence of the phosphates contained in the animal charcoal used, forming an insoluble phosphate of lead.

PURE WATER FOR VIENNA. — Since the introduction into Vienna of a pure water-supply, the mortality from typhoid-fever has been greatly reduced, as well as that from other diseases. Since 1880 there has not been a death from dysentery in the city. Up to 1861 there were ten thousand wells in use in the city, and also public and private aqueducts bringing water from the Danube Canal. Although it is not so stated, we infer that these all have been abandoned. As a result of this improvement in the public health of Vienna, it would appear that water is the principal agent in the transmission of typhoid-fever, and that, in order to cause this disease almost entirely to disappear from a large city where it is endemic, it is only necessary to furnish to the inhabitants water of unquestionable purity, and in sufficient quantity.

DISINFECTION OF LIBRARY BOOKS. — The danger of infection from the use of books from circulating libraries has received intelligent attention in England, and means have been devised for their disinfection. The principal on which disinfection is based is the vaporization of carbolic acid by heat, whereby it is claimed that its action is more potent. Heat is applied to the outer casing of an apparatus, which is fully under control, so that a temperature which might injure the books can be avoided. The heat employed is from 150° to 200° F., the books being subjected to this temperature for fifteen minutes, and not injured by the process. The apparatus is said to be patented.

MORPHINE HABIT IN PARIS. — It is said that in Paris thousands of women are cutting short their careers by the use of morphine. Morphine disks are dissolved in a small bottle of water, and this is placed in a case which includes a tiny syringe. The whole apparatus is of a miniature description, and can be conveniently carried inside the smallest muff. The vice has become so fashionable that women actually fill their syringes before starting for the theatre, and thus have the means at their disposal, any moment, of injecting themselves with the drug while lounging in the *fauteuils* or in their boxes.

PASTEUR. — Pasteur and his treatment of hydrophobia — two topics which occupied the attention of the scientific world for so long a time — have hardly received even a mention of late either in the medical or the popular journals. Two of the patients treated by Pasteur for rabies have died during the present year. One of these was a boy, aged four, who was bitten by a mad dog on Dec. 6 last, and was under treatment at Pasteur's Institute from the 12th of December, 1887, until the 7th of January this year. He died of hydrophobia on Jan. 22. The second case was that of a woman, aged fifty-two. She was bitten on Jan. 23 of the present year, and was placed under Pasteur's treatment on Jan. 29. She died on Feb. 17 of hydrophobia.

ILLUMINATING-GAS. — A remonstrance largely signed by the physicians of Massachusetts has been presented to the Legislature of that State against the passage of any law allowing the manufacture of illuminating-gas containing more than ten per cent of carbonic oxide, as the intensely poisonous properties of that element of gas are well known, and are dangerous to health and life.

TYPHOID VACCINATION. — Chantemesse and Vidal communicated to the Société de Biologie some interesting observations on vaccination against typhoid-fever, claiming that in mice inoculated with cultures of typhoid bacilli a disease is produced with lesions the same as in human typhoid-fever. Mice inoculated with bouillon in which colonies have lived, but which no longer contain the bacilli, resist subsequent inoculation with the most intense typhoid virus.

ELECTRICAL SCIENCE.

Central Station Lighting.

ONE of the most interesting and important contributions to the question of alternating *versus* continuous currents for electrical distribution is the paper of Mr. Crompton, read before the English Society of Telegraph Engineers and Electricians. Mr. Crompton takes up the questions of expense of installation and of working, for two stations; one using alternating currents, the other using continuous currents and storage-batteries. The estimate for installation differs slightly from that given in a previous paper by the same author, an abstract of which was given in this journal, and enters much more into detail.

Mr. Crompton considers the cost for 10,000 lamps, to be supplied at one time from the central station. For the batteries the plan he advocates is the establishment of sub-stations where the storage-cells are to be placed. The lamp-circuits are permanently con-

nected to the batteries, which really are more used for transforming the comparatively high potential employed than for storing the electrical energy. The batteries are of such a capacity that they can supply one-third of the energy required during the time that the maximum number of lights exceeds the capacity of the central station. If the maximum energy required is 600 kilo-watts, the central station will only have a capacity of 400 kilo-watts; the battery supplying the remaining 200 when it is needed, and being charged when the demand falls below 400 kilo-watts, the capacity of the station. It will be found, however, that this plan does not utilize the storage-battery to the full extent possible, as the central station will be idle for part of the twenty-four hours. What it does, however, is to diminish the size of the central station and equipment by one-third, and allow the electrical energy to be distributed at a high potential, by comparatively small conductors. The potential Mr. Crompton proposes to use is in the neighborhood of 450 volts, a value which seems rather low.

For the alternating system a potential of 2,000 volts is assumed, with a transformer for every one or two houses. Calculating the cost of installing the above plants, Mr. Crompton finds that the alternating system will come to £57,440; the direct system, with storage-batteries, £59,762. In calculating the running expenses it is assumed that the batteries deteriorate only fifteen per cent per year, an extremely low estimate. The following is the estimate of working expenses for a year: —

	Accumulator.	Transformer.
Materials (coal, etc.)	£2,517 os. od.	£4,648 os. od.
Labor and salaries	1,995 0 0	2,608 8 0
Maintenance of plant	4,086 10 0	4,683 5 0
Total	11,939 13 0	8,598 10 0
Cost per unit	3.75d	2.7d

These results, provided they were true, would be very encouraging, since they would allow electric lights to be sold at a price that would correspond to gas at seventy-five cents per thousand, with an extremely handsome percentage on the original outlay. Mr. Crompton has omitted in his estimate the cost for rent and attendance at the battery stations, — items that would add about £1.000 per year to the accumulator account, but which would still give a balance in its favor. While in this country the conditions of distribution are different, a plant of 10,000 lights being smaller than would be built in any large city, yet the comparative values given will not be greatly modified; and when we consider that here the distribution of power must be taken into account, and credited to the direct system, — power distribution being impossible at present with alternating currents, — the moral of Mr. Crompton's figures seems to be that the alternating system has no place in densely populated centres, but must be relegated to towns and the suburbs of cities, where there is a field for it as wide as its most enthusiastic disciples can wish.

ELECTRIC STREET-CARS IN BALTIMORE. — In the last few weeks a car equipped with electric motors and storage-batteries has been running in Baltimore, with a success that promises at least a systematic experiment to determine the expense and the value of the system. The condition of the street-railway tracks in Baltimore — the heavy grades and sharp curves — is such that the demand on a secondary battery is very trying; there is also a heavy demand on the motors, which must develop as much as 20-horse power for considerable distances. In order to avoid too heavy a discharge-rate from the battery, a larger number of cells are employed than would be ordinarily used. The details of the equipment are as follows: the car is a large sixteen-foot car, furnished with two Sprague motors of 7½-horse power each, capable of working up to over 10-horse power. The gearing is the ordinary gearing of the Sprague system, and has been described in this journal. The weight of the motors and gears is about 1,600 pounds. The battery consists of 126 cells placed beneath the seats, arranged in boxes of nine cells each. The cells are of the grid type, manufactured by the Accumulator Company under the patents of Faure, Sellon, Swan, etc.; the Electrical Storage Company of Baltimore having the patent rights for Maryland, the District of Columbia, and West Virginia. The cells weigh about 4,200 pounds, and the total weight of the car is 13,000 pounds. Before the car was tried, there was considerable doubt, even among members of the company, whether it would successfully take the heavy grades that the track offers. It has been running, however, for several weeks with excellent results: it ascends the steepest grades with ease, and much faster than do horse-cars; there is very little noise; the car is under most perfect control; and, as far as performance goes, it is a decided success. The question of cost has yet to be settled. If we take a number of cars, and if the street-car company supplies its own power, the cost per car per day for power will not exceed $1.75, counting all the expenses excepting only the deterioration and handling of the battery. As the cost of horse-power per car per day for the same service is not less than $6, the margin for repairs and attendance is about $4.25 per car per day. Whether that amount will suffice can only be determined by trial; but if every precaution is taken, and if the battery and motor are properly designed for the work they have to do, it is probable that the expenses will not be greater than the cost of horses. As to the increased comfort, there is no question.

SUSPENSIONS FOR GALVANOMETERS. — Dr. G. A. Liebig, in an article in the *Electrical World*, gives the results of some experiments on different kinds of silk for galvanometer suspensions. If ordinary silk fibres be used to suspend delicate astatic systems, there will be found some trouble from capricious movements of the needles. Dr. Liebig shows that these are probably due to two things. In the first place, an ordinary fibre of silk obtained from a cocoon consists of two single fibres surrounded by a "gummy substance of a gelatinous nature," the last making up about one-third the bulk of the fibre. The disturbing effects seem due to, in the first place, not separating the two parts of the double fibre; and, in the second place, to the changes in the outer gelatinous coating from moisture, etc. The remedy lies in using only a single fibre, and in washing it in hot water, dissolving off the coating. The variety of silk known as 'tussus' is especially recommended, a single fibre being able to sustain from five to seven grams, as against two grams for ordinary silk.

BOOK-REVIEWS.

Ancient Legends, Mystic Charms and Superstitions of Ireland. By LADY WILDE. Boston, Ticknor. 12°. $2.50.

THE present volume contains a great number of legends and current beliefs of Ireland, collected by an enthusiastic lover of the island and of its people. Many of the legends were directly obtained from oral communications, and the simplicity of the style in which they are told adds to their attractiveness. The contents of the volume are of great variety. A number of legends treating mainly of fairies and kindred subjects is followed by a description of festivals and myths referring to their meaning and origin. Marriage rites and mortuary customs are fully described, and in reading these we were much pleased with the author's remark that there is nothing derogatory to grief in the idea of hired mourners. "On the contrary," she says, "it is a splendid tribute to the dead to order their praises to be recited publicly before the assembled friends; while there is something indescribably impressive in the aspect of the mourning women crouched around the bier." It is this endeavor of the author to present usages, superstitions, and beliefs from the standpoint of those who hold to them, which makes the book particularly valuable, and attractive to the reader. It seems to us that the author has been eminently successful in this attempt. A special chapter treats of medical superstitions. A comparison of these remarks with Mr. Mooney's paper mentioned in a recent number of *Science* will be of interest. Legends referring to the sidhe and banshee receive special attention, while there are comparatively few treating of the saints and their exploits. The theories of the author regarding the origin of the various legends and customs occupy only a small portion of the book, and will hardly stand a severe test. The appendix, which treats principally of the antiquities of Ireland, of early Irish art and the ancient